In the Claims:

1-23. Cancelled.

24. (New) A method of inducing functional bone formation at a site of bone infirmity in a human, comprising the steps of:

(a) transforming a cultured mesenchymal stem cell with a DNA encoding bone morphogenesis protein 2 (BMP-2);

(b) culturing the cultured mesenchymal stem cell transformed in step (a), under conditions enabling expression of said DNA encoding bone morphogenesis protein 2; and

(c) implanting said cultured mesenchymal stem cell at a site of bone infirmity

whereby autocrine and paracrine effects of expressed bone morphogenesis protein 2 at said site of bone infirmity result in functional bone formation, thereby inducing functional bone formation at a site of bone infirmity.

25. (New) The method of claim 23, wherein said mesenchymal stem cell is a primary cell.

26. (New) The method of claim 23, wherein said mesenchymal stem cell is a cultured cell line.

27. (New) The method of claim 23, wherein said mesenchymal stem cell expresses an endogenous bone morphogenesis protein receptor.

28. (New) The method of claim 24, wherein said mesenchymal stem cell expresses parathyroid hormone and a parathyroid hormone receptor protein.